

# New Flux Generation for GENIEHelper

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# Modifications Made

- The modifications that I have placed on various feature branches

## User Defined Flux Function

### nutools

feature/zennamo\_FunctionalFormFlux

### larsim

feature/zennamo\_FunctionalFormFlux

### uboonecode

feature/zennamo\_FunctionalFormFlux

# New Flux Functionality

- Within nutools GENIEHelper allows the user to define a few different types of fluxes
  - I added a new one that allows the user to pass an arbitrary function as an std::string

## nutools: GENIEHelper.cxx

```
else if(fFluxType.compare("function") == 0){  
  
    genie::flux::GCylindTH1Flux* histFlux = new genie::flux::GCylindTH1Flux();  
    TF1* input_func = new TF1("input_func", fFunctionalFlux.c_str(), fEmin, fEmax);  
    TH1D* spectrum = new TH1D("spectrum", "neutrino flux", 1000, fEmin, fEmax);  
    spectrum->Add(input_func);  
}
```

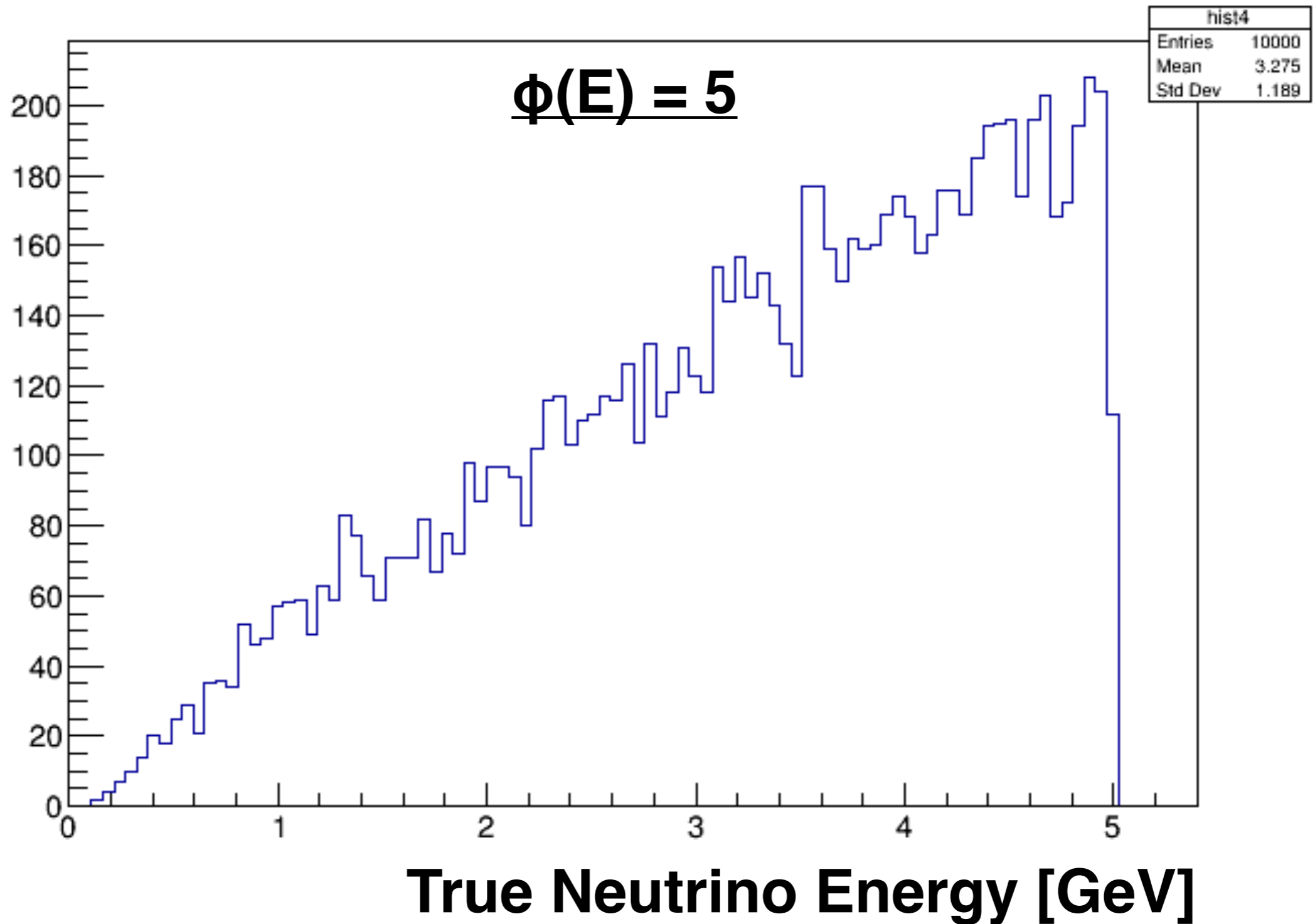
- Where this is controlled via fhicl parameters:

## larsim: genie.fcl

```
standard_genie_uniform_flux.FluxType: "function"  
standard_genie_uniform_flux.FunctionalFlux: "x"  
standard_genie_uniform_flux.FluxEmin: 500  
standard_genie_uniform_flux.FluxEmax: 600
```

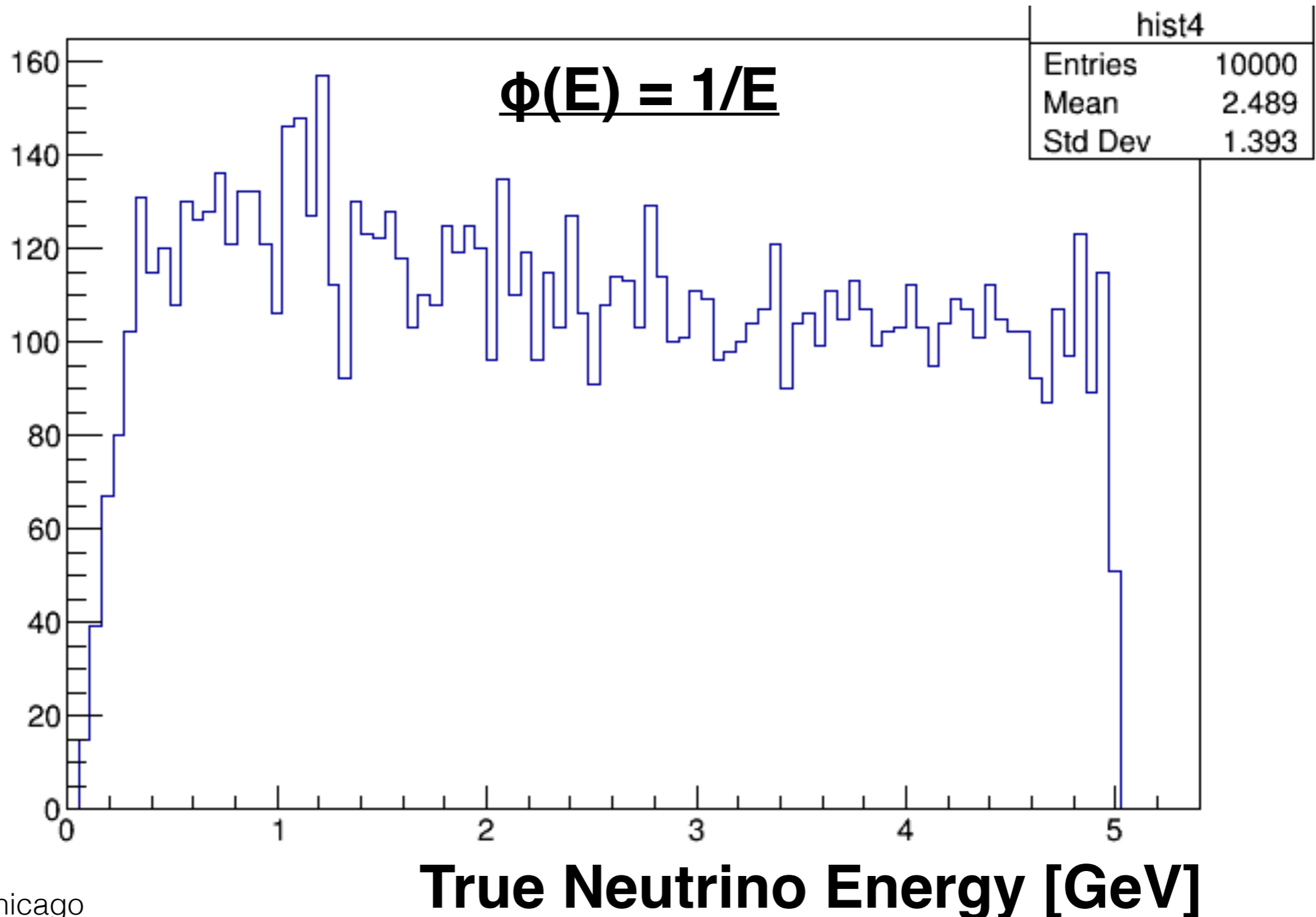
# Example: flat flux

- The electron neutrino event rate for a flat flux



# Example: $1/E$ flux

- The electron neutrino event rate for a flux which mimics the neutrino cross section (**i.e. if a user wants a ~flat event rate**)



# Conclusions

- I'd like to have this merged into nutools